**RUNNING HEAD: PRODUCTIVE PROCRASTINATION AND ALCOHOL**

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**Productive Procrastination: Academic Procrastination Style Predicts Academic and Alcohol Outcomes**

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**Abstract**

Using a person-centered analysis, we identified adaptive and maladaptive procrastination styles associated with academic and alcohol outcomes in a sample of 1106 college undergraduates. Productive procrastination is defined by the replacement of one adaptive behavior with another adaptive—albeit less important—behavior (e.g., organizing notes instead of studying for an exam). Cluster analysis identified five unique academic procrastination styles—*non-procrastinators*, *academic productive procrastinators*, *non-academic* *productive procrastinators, non-academic procrastinators* (high levels of unproductive and productive non-academic procrastination) and *classic procrastinators*. Controlling for gender, procrastination style predicted alcohol-related problems, risk of alcohol use disorders, and GPA (all *ps* < .01). Academic productive procrastinators and non-procrastinators reported the most positive academic and alcohol outcomes. Non-academic procrastinators reported lower GPA, more alcohol-related problems and increased risk of alcohol use disorders. Non-academic procrastinators’ lower GPA was mediated by alcohol cravings and alcohol-related problems, as measured by AUDIT and RAPI scores. These findings suggest that certain maladaptive styles of procrastination may be a useful risk indicator for preventative and intervention efforts.

Keywords: procrastination, alcohol, college students, drinking, GPA

**Introduction**

Jennifer has an upcoming chemistry exam. She dreads the exam and decides to delay the inevitable by going out to a bar with her friends and drinking instead of studying. As a result, she receives a poor grade on her exam. Procrastination, the decision “to voluntarily delay an intended course of action despite expecting to be worse off for the delay,” (Steel, 2007, p. 66) is associated with various negative outcomes (e.g., poor health, financial instability, stress, work performance; Steel, 2007; Zarick & Stonebraker, 2009) and traditionally attributed to failures in self-regulation or motivation (Soloman & Rothblum, 1984; Steel, 2007, p. 66; but see Chu & Choi, 2005). It is commonplace, with an estimated 80-95% of college students regularly procrastinating in their courses (Steel, 2007).

We focused on the link between procrastination and drinking given the substantial burden and unique context associated with college student drinking (Johnston et al., 2010; Steel, 2007). Procrastination has been linked to greater alcohol consumption (Phillips & Ogeil, 2009, Sirois & Pychyl, 2002) and more alcohol-related problems (Jamrozinski, Kuda, & Mangholz, 2009), possibly due to higher trait impulsivity (McCown & Roberts, 1994; Steele, 2007), greater discounting of delayed losses and gains (Takahashi, Ohmura, Oono, & Radford, 2008) and/or drinking as a self-handicapping strategy (Berglas & Jones, 1978; Jamrozinski, Kuda, & Mangholz, 2009; Richards, Zhang, Mitchell, & de Wit, 1999). We sought to evaluate the relationship between procrastination, drinking, and academic achievement by identifying specific types of maladaptive procrastination. We also investigated whether hazardous drinking mediated the relationship between problematic procrastination and academic achievement, as in our opening example.

**Reconceptualizing Procrastination**

Although often considered to be wholly maladaptive, some forms of procrastination may be less harmful than others. We distinguish between two forms of “productive” procrastination: 1) academically productive procrastination, in which students procrastinate on one assignment by working on a less important or easier assignment, and 2) non-academic productive procrastination, in which students do non-classwork-related activities that are important but not necessarily enjoyable (e.g., washing dishes, exercising, paying bills).

Unlike traditional procrastination, which replaces adaptive behaviors with maladaptive behaviors, productive procrastinations replace one adaptive behavior with another adaptive—albeit less important—behavior (e.g., organizing notes instead of studying for an exam). Academic and non-academic productive procrastination differ in whether the primary academic activity is replaced by a behavior *inside* or *outside* the academic domain (e.g., organizing notes vs. exercising). Substituting one adaptive (but less desirable) behavior for another may have less severe consequences than substituting neutral or maladaptive behaviors. For instance, individuals engaging in productive procrastination are, by definition, not using alcohol as a means of procrastinating. Students engaging in academic procrastination are still completing academic tasks and should perform better academically than students who procrastinate using non-academic tasks. Preliminary evidence suggests that college students regularly engage in both academic and non-academic productive procrastination (Wormington et al., 2011), but whether these procrastination styles are associated with hazardous drinking or academic outcomes is unknown.

A limitation of the extant research is that it assumes that students procrastinate in the same way in every situation. However, students may choose to procrastinate—or employ different forms of procrastination—depending on the circumstances. The combination of procrastination responses to an academic task—or “procrastination style”—may be particularly important for research on complex outcomes like hazardous drinking. In this study, we evaluate students’ “procrastination styles” using a person-centered correlational approach, which examines how individual behaviors combine into discrete “styles” to predict outcomes of interest (Bergman & Trost, 2006). This approach complements variable-centered analyses (e.g., regression analysis), which focus on relations between variables.

**Current Study**

The current study investigated whether college students report distinct procrastination styles and if procrastination styles are uniquely related to self-reported hazardous drinking (i.e., greater alcohol consumption, alcohol-related problems, clinical screening measures for alcohol use disorders, and alcohol cravings) and academic success (i.e., GPA). We chose to examine alcohol cravings due to the recent inclusion of cravings as a criterion for alcohol use disorders(*DSM–5*; American Psychiatric Association, 2013). Because traditional measures of procrastination do not distinguish between productive and non-productive forms, we assessed productive procrastination using a series of vignettes. We chose to use vignettes based on work suggesting that behavioral tendencies are best measured by presenting concrete scenarios (Ouellette & Wood, 1998; Peng, Nisbett, & Wong, 1997).

 We predicted that distinct naturally occurring combinations (“styles”) of procrastination would emerge. We expected students with procrastination styles characterized by non-procrastination and/or productive procrastination would report reduced hazardous drinking and higher GPAs. We also expected that procrastination styles characterized by unproductive procrastination would be associated with increased hazardous drinking and lower academic performance. Additionally, we conducted mediation analyses to investigate whether the relationship between procrastination style and GPA might be mediated by drinking, reasoning that maladaptive procrastination styles may lead to hazardous drinking that subsequently impacts academic achievement.

**Method**

**Procedure**

Procedures were approved by the university’s Institutional Review Board. Participants were recruited from a randomized list of 2500 current, full-time undergraduate students and invited via email to participate in a study about cognitive processes and alcohol. Forty-four percent of the students elected to participate via a web site, where they completed a battery of questionnaires as part of a larger study, and were compensated $15. This response rate is typical for non-participant pool samples at this institution.

**Participants**

Participants consisted of 1106 undergraduates (654 women, 449 men, 2 transgender, 1 declined to answer; *Mage =* 20.40, *SD* = 1.60, range = 18-25; 59% White, 27% Asian, 8% bi- or multi-racial, 6% Black/African American, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, unknown, or declined to answer). Two participants were excluded from analyses due to suspect data, leaving a final sample of 1104 participants.

**Measures**

***Procrastination*.** The Procrastination Styles Questionnaire measured the perceived likelihood of engaging in four behavioral responses to ten difficult academic scenarios (Table 1). The four responses were non-procrastination (“Get started on it right away”; α = .93), academic productive procrastination (“First work on an academic easier task that is due relatively soon”; α = .94), non-academic productive procrastination (“First do something non-academic but productive [clean your room, do the dishes, exercise, etc.]”; α = .96), and classic procrastination (“First do some non-academic, not necessarily productive task e.g., check Facebook, watch television, socialize with friends, etc.”; α = .96). For each scenario, participants rated the likelihood that they would engage in each of the four behavioral responses on an 11-point scale from 0% to 100%[[1]](#footnote-1).

***Academic performance.*** Participants self-reported their most recent GPA on a 0 to 4.0 scale. Self-report measures of grades are well-validated and correlate strongly with actual grades (Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987; Gray & Watson, 2002; Kuncel, Credé, & Thomas, 2005; Noftle & Robins, 2007).

***Alcohol consumption.*** The Daily Drinking Questionnaire (DDQ; Collins et al., 1985; α = .69) assesses typical weekly alcohol consumption over the past month. Participants reported how many US standard drinks they consumed on each day of a typical week. Scores reflect the total number of drinks consumed per week. Participants were provided with common standard drink equivalencies.

***Alcohol Problems.*** The Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) asks participants to report how many times in the past 3 months (0 = “never;” 4 = “more than 10 times”) they experienced 23 symptoms of problem drinking and negative consequences as a result of drinking (α = .93)[[2]](#footnote-2). Severity of problems ranged from mild (“Had a bad time”) to serious (“Suddenly found yourself in a place that you could not remember getting to”). Two additional items were added asking participants how often they had driven shortly after consuming two and four drinks, respectively.

***Alcohol Use Disorders.*** The Alcohol Use Disorders Identification test (AUDIT; Babor et al., 2001) is a widely used 10-item measure that can identify individuals at risk for meeting criteria for alcohol use disorders. Participants are asked how much and how often they typically drink on a typical day, as well as how often they report cravings and problems due to alcohol (0 = “never;” 4 = “daily or almost daily;” α = .79)[[3]](#footnote-3).

***Alcohol Cravings.*** Cravings were measured using the Alcohol Craving Questionnaire Short Form-Revised (ACQ; Singleton et al., 1995). Twelve items measured current alcohol craving (e.g., “If I had some alcohol I would probably drink it”), including alcohol use intentions, anticipated effects of drinking, and lack of control, on a 7=point scale (-3 = “strongly disagree”; 3 = “strongly agree”; α = .80). The final item of the ACQ was omitted due to a programming error.

**Analysis Plan**

 We first identified naturally-occurring patterns of procrastination using cluster analysis, which assigns participants to a procrastination style. These styles were then used as a categorical variable in subsequent analyses. For data that were normally distributed (i.e., academic performance, alcohol cravings), we used one-way analysis of co-variance (ANCOVA) and one-way analysis of variance (ANOVA) to analyze the relationship between procrastination style and outcome variables. For non-normally distributed alcohol variables (i.e., alcohol consumption, AUDIT, alcohol problems), data were entered into a generalized linear model – specifically, a count regression model with a negative binomial log link (see Atkins & Gallop, 2007). Generalized linear models are similar to OLS regression, but can accommodate dependent variables with non-normal distributions. Following significant omnibus tests, we conducted planned comparisons contrasting each of the procrastination styles against non-procrastinators. Gender was entered as a dummy-coded control variable in all alcohol analyses to control for known effects of gender on drinking outcomes. Following our primary confirmatory analyses, we conducted an exploratory analysis to test whether alcohol mediated the relationship between procrastination style and GPA.

**Results**

**Descriptive Statistics**

Descriptive statistics are displayed in Table 2. On average, participants reported consuming six drinks per week on a typical week during the last month and experiencing five alcohol-related consequences over the last three months. Overall, 89.8% of participants reported at least one forecasted instance of procrastination (i.e., a > 50% chance of procrastination in at least one scenario). Participants endorsed each of the four procrastination strategies (non-procrastination: 66.74%, productive academic procrastination: 50.69%, productive non-academic procrastination: 40.04%, classic procrastination: 44.02%). These values were not mutually exclusive.

**Procrastination Styles**

We identified procrastination styles using a two-step cluster analysis using a hierarchical (Ward’s linkage) followed by non-hierarchical (*k* means) technique (cf., Hair, Anderson, Tatham, & Black, 1998)[[4]](#footnote-4). Participants’ composite raw scores for non-procrastination, academic productive procrastination, non-academic productive procrastination, and classic procrastination on the academic scenarios were clustered to identify common procrastination styles; values were centered around each participants’ average response to account for individuals’ general response bias. The optimal cluster solution consisted of clusters which represented a sizable portion of the sample, were theoretically meaningful, and successfully grouped individuals with similar patterns of values.

Using these criteria, a five-cluster solution best represented the data (see Figure 1). These five procrastination styles represented unique combinations of procrastination behaviors. Students in the *non-procrastinator* profile (*n* = 200) reported above average non-procrastination and lower levels of both academic and nonacademic procrastination. Students in the *academic* *productive procrastinator* profile (*n* = 201) reported both non-procrastination and academic productive procrastination, with an absence of non-academic forms of procrastination. Students in the *non-academic productive procrastinator* profile (*n* = 350), by contrast, reported high levels of both academic and non-academic productive procrastination. Students in the *non-academic* *procrastinator* profile (*n* = 190) reported mostly non-academic procrastination (both productive and unproductive). Finally, students in the *classic procrastinator profile* (*n* = 160) reported high levels of non-academic unproductive procrastination only, without other forms of procrastination. It is interesting to note that this last group, the smallest of the five profiles identified, is the form of procrastination as it is typically conceptualized.

**Alcohol and Academic Outcomes**

 *Alcohol-related problems.* Procrastination style uniquely predicted self-reported alcohol-related problems (Wald χ2 = 40.77, *p* < .001; Table 3) in an overall test of the model. Specifically, relative to *non-procrastinators*, *non-academic procrastinators* reported significantly more alcohol-related problems (*p* < .001), and *academic productive procrastinators* reported marginally fewer problems (*p* = .07). No other groups differed significantly from *non-procrastinators*. Gender also accounted for significant variance in alcohol-related problems.

 *AUDIT scores.* Procrastination style significantly predicted AUDIT scores (Wald χ2 = 21.47, *p* < .001; Table 3) in an overall test of the model. Specifically, relative to *non-procrastinators*, *non-academic procrastinators* reported significantly higher AUDIT scores (*p* < .01). None of the other groups differed significantly from non-procrastinators. Gender also accounted for significant variance in AUDIT scores.

 *Alcohol cravings*. A one-way analysis of covariance (ANCOVA) revealed that procrastination style significantly predicted Alcohol Cravings, *F*(4,1086) = 5.95, *p* < .001, = .02 (Table 3). Specifically, *non-academic procrastinators* reported significantly stronger alcohol cravings (*p* < .001). Likewise, *classic procrastinators* (*p* = .06) and *non-academic productive procrastinators* (*p* = .08) reported marginally stronger alcohol cravings. *Academic productive procrastinators* did not differ from *non-procrastinators* (*p* = .84, *ns*). Gender also accounted for significant variance in alcohol cravings.

*Drinks per week*. Procrastination style did not predict overall alcohol consumption (Wald χ2 = 6.26, *ns; Table 3*) in an overall test of the model. Gender accounted for significant variance in alcohol consumption.

 *Academic outcomes.* A one-way ANOVA revealed that procrastination style was a significant predictor of students’ most recent GPA, *F*(4,1086) = 11.54, *p* < .001, p = .04. Overall, *classic procrastinators* (*M* = 3.32, *SD* = .46) *and non-academic procrastinators* (*M* = 3.30, *SD* = .42) reported lower GPAs overall than *non-procrastinators* (*M* = 3.51, *SD* = .41), *academic productive procrastinators* (*M* = 3.52, *SD* = .37), and *non-academic productive procrastinators* (*M* = 3.44, *SD* = .40). Post-hoc Tukey tests revealed that these differences were significant, *p*s <.001. The GPA of *academic productive procrastinators* did not differ from *non-procrastinators* (*p* = .99).

**Mediation**

In follow-up analyses, we tested whether hazardous drinking mediated the relationship between procrastination and academic outcomes for *non-academic procrastinators*. Given our findings, we focused on alcohol cravings, AUDIT, and RAPI scores. Membership in the *non-academic procrastination* style was dummy-coded (0 = Non-member, 1 = Non-academic procrastinator). Sobel tests indicated that hazardous drinking (i.e., AUDIT and RAPI scores) and alcohol cravings significantly mediated the association between procrastination and grade point average. The relation between the *non-academic procrastination* style and grade point average (*b* = -.146, *p* < .0001) decreased when controlling for AUDIT (*b* = -.009, p = .002), RAPI (*b* = -.008, *p* = .001), and alcohol cravings (*b =-.*006, *p* < .001). Overall, the AUDIT and RAPI accounted for 17.43% and 10.26% of the association between non-academic procrastination and grade point average, respectively; cravings accounted for 12.46% of the variance.

**Discussion**

Procrastination and alcohol use are widespread during college. We introduced a new concept – productive procrastination - and proposed that students’ procrastination tendencies should be considered as a whole (i.e., procrastination styles). We were not only interested in *how* students procrastinate, but - more importantly – in the repercussions of that procrastination. Procrastination styles were related to self-reported alcohol problems, risk of alcohol use disorders, alcohol cravings, and academic achievement, even when controlling for known predictors of drinking. Moreover, alcohol problems and alcohol craving mediated the relationship between maladaptive procrastination and academic performance. Together, these findings suggest that differences in adaptive versus maladaptive procrastination styles may have important consequences in college.

What procrastination styles were most adaptive? Adaptive procrastination styles—characterized by non-procrastination (i.e., *non-procrastinators*) and academic productive procrastination (i.e., *academic productive procrastinators*)—were defined as those associated with higher grades and decreased risk of alcohol problems, cravings, and risk of alcohol use disorders compared to maladaptive procrastination styles*.* Interestingly, *academic productive procrastinators* and *non-procrastinators* did not significantly differ from one another, suggesting that not all procrastination is maladaptive. Maladaptive procrastination styles—characterized by using non-academic forms of procrastination – were defined as styles associated with poorer academic and alcohol outcomes. In particular, *non-academic productive procrastinators* reported marginally lower grades and marginally more alcohol cravings than non-procrastinators, and *classic procrastinators* reported significantly lower grades than non-procrastinators. *Non-academic procrastinators* fared the worst, reporting the most alcohol-related problems, highest risk of alcohol use disorders, greatest alcohol cravings, and lowest grades. In addition, we found that alcohol-related problems, risk for alcohol use disorders, and alcohol cravings partially mediated the relationship between the *non-academic procrastination* style and lower GPA. One possible explanation is that students who procrastinate using maladaptive behaviors might be engaging in drinking as a form of procrastination, as suggested by classical characterizations of procrastination (Steel, 2007).

Surprisingly, *non-academic procrastinators* reported more negative outcomes than *classic procrastinators*. One post-hoc but nonetheless intriguing explanation for this finding is that *non-academic procrastinators* may be using non-academic productive tasks (such as cleaning or exercising) as justification for not getting started on assignments. Supporting this hypothesis, *classic procrastinators* and *non-academic procrastinators* are similar in that they both report being equally likely to respond to a difficult academic task by first doing something non-academic and non-productive (e.g., watching television). However, non-academic procrastinators also report that they are *more likely* to engage in a productive non-academic task (e.g., washing dishes) than classic procrastinators, and *less likely* to actually get started on the assignment. Engaging in productive behaviors of this type may give people psychological license to engage in other less adaptive behaviors later, including drinking and failing to complete assignments. Such “moral licensing” has been found in other domains (Chiou, Wan, Wu, & Lee, 2011; Monin & Miller, 2001; Sachdeva, Iliev, & Medin, 2009) and occurs when “past good deeds…liberate individuals to engage in behaviors that are immoral, unethical, or otherwise problematic” (Merritt, Effron, & Monin, 2010, p. 344). Having done the laundry earlier, *non-academic procrastinators* may feel more comfortable neglecting their studies to party later. This explanation, of course, is speculative and an interesting avenue for future research.

Understanding the role of procrastination in college student drinking is important not only theoretically, but also in identifying individuals at risk and facilitating prevention and intervention efforts. While not all forms of procrastination are harmful, maladaptive procrastination styles were associated with elevated risk of serious consequences, including hazardous drinking and poor academic performance. Students experiencing poor academic performance and engaging in maladaptive procrastination might be prime candidates for screening. Although procrastination style was a risk factor for alcohol-related problems and risk of alcohol use disorders, it notably did not predict overall alcohol consumption. Non-procrastinators and adaptive procrastinators drank just as much as maladaptive procrastinators, but without the same negative consequences. Maladaptive procrastinators may be drinking more when they are procrastinating, but less on other nights. Alternatively, non-procrastinators and adaptive procrastinators may be drinking more responsibly. Maladaptive procrastination may indicate an elevated risk of engaging in hazardous or risky drinking behaviors, such as binge drinking or rapid alcohol consumption, even if they are not consuming more than their peers. Future research is needed to determine what drinking behaviors drive these differences.

**Limitations and Conclusion**

Our findings are constrained by several limitations. There is likely a bidirectional relationship between alcohol use and procrastination, with maladaptive procrastination leading to increased alcohol use and vice versa. However, questions of causal influence cannot be tested with our cross-sectional design and future longitudinal work and experimental designs are necessary to establish causality. Additional limitations include the use of a single sample of university students and self-reported measures. Although both the alcohol and academic self-report measures are well-validated, they not immune to response bias. It is also possible that participants included “drinking” as a form of classic procrastination behavior.

Finally, although our results are confined to college student drinking (including potential underage drinking), procrastination is common in other contexts. Are the maladaptive procrastination styles identified in this study indicative of alcohol outcomes in other populations at home or in the workplace? Would the way in which a person procrastinates on their tax return predict their drinking behavior? It is unclear whether the relationship between procrastination and drinking among college students should generalize to other populations, given the unique context of college drinking culture and the presence of underage populations. However, our general framework of productive procrastination –substituting an important, urgent task with another adaptive task – likely does exist in other domains. Future research should test these questions and directly examine possible third variables, such as conscientiousness and self-regulatory capacity.

 This study represents an important step forward in understanding the role of procrastination in college drinking, and in identifying and differentiating between adaptive and maladaptive procrastination. Alcohol outcomes among procrastinators may vary in part because procrastination strategies vary. Indeed, *academic productive procrastinators* in our study were at no greater risk for poor alcohol or academic outcomes than non-procrastinators. Trends in the data suggest that academic productive procrastination may even be protective. On the other hand, some forms of procrastination are clearly maladaptive. In particular, *non-academic procrastinators* reported significantly more alcohol-related problems (RAPI), higher AUDIT scores, stronger alcohol cravings, and lower grades than non-procrastinators. This kind of procrastination - characterized by high levels of non-academic procrastination paired with very low levels of getting started on assignments - may be a prime target for future prevention and intervention programs.

In closing, it is critical to acknowledge that (1) students do not respond using the same strategies in all situations and (2) there are adaptive and maladaptive forms of procrastination, which may be uniquely linked to important outcomes in college students. By ignoring these distinctions, researchers overlook important differences in procrastination that may predict hazardous behaviors down the road.

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Table 1. Procrastination Styles Questionnaire.

|  |  |
| --- | --- |
| **Scenarios** | **Response Options** |
| 1. It is Sunday afternoon and you recall that you have a paper due soon in your hardest class. | *[For all scenarios]*Rate the likelihood that you would:1. Get started on it right away [0-100%]
2. First work on an easier academic task that is due relatively soon [0-100%]
3. First do something non-academic but productive (clean your room, do the dishes, exercise, etc.) [0-100%]
4. First do some non-academic, not necessarily productive task (check Facebook, watch television, socialize with friends, etc.) [0-100%]
 |
| 2. You have a problem set that you are not sure you will do well on and it is due soon. |
| 3. You just picked up a take-home exam from one of your classes that is due soon. You have as much time to work on it as you like, as long as you turn it in by 5pm the day it's due. The teacher has warned that due to its difficulty, many students may need much of that time in order to do well on it. |
| 4. You have a few free hours. You were checking your email in the library/computer lab/coffee shop and your professor just assigned you a short but difficult assignment due soon. |
| 5. The date of your midterm has just been announced for your most time-consuming class and it is a few days from now. You've heard from students in previous years that this midterm is particularly hard and that lots of people fail it. |
| 6. You planned on working on a particular assignment this afternoon but you find out that it is going to be much more difficult than expected. |
| 7. The reading for your next class is very long and particularly dense. Your professor has suggested that the class spend more time than usual discussing the reading, because students have struggled with understanding it in the past. |
| 8. You check your email and your professor has just sent out the review sheet for the final in your most difficult class. |
| 9. You are working on a lab report for one of your science classes. You've found your section of the report to be more complicated and difficult than you expected, and your lab group is waiting on you to finish your section of the report. |
| 10. Your midterm for one of your classes is in the form of a paper, to be written over the course of one week. When the topic is announced, it is clear that the paper is going to be fairly lengthy and require a good bit of background research in an area you are not very familiar with. |

*Table 2*

*Descriptive statistics for academic and alcohol measures*

|  |  |  |
| --- | --- | --- |
|  | Mean | Standard Deviation |
| 1. Drinks  | 6.48 | 9.00 |
| 2. RAPI | 5.22 | 8.35 |
| 3. AUDIT | 6.28 | 5.83 |
| 4.Cravings5. GPA | -12.843.43 | 8.29.42 |

Note: *N* = 1104. RAPI = total score on the Rutgers Alcohol Problems Index. AUDIT = total scores on the Alcohol Use Disorders Identification Test

*Table 3. Procrastination as a cross-sectional predictor of drinking outcomes*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *B* | SE *B* | Exp. *B* | *t* | *Cohen’s D* |
|  | Drinks per week  |  |
| Gender | -.50 | .08 | 0.61 | 6.25\*\*\* | .38 |
| Procrastination Style *Non-procrastinators* *Academic productive*  *procrastinators* *Non-academic productive*  *procrastinators* *Non-academic procrastinators* *Classic procrastinators* | 0-.07.03.19-.09 | ..14.12.13.15 | ..931.031.21.91 | .-.50.251.46-.06 | ..03.02.09.00 |
|  | RAPI scores |  |
| Gender | -.16 | .07 | .86 | -2.29\*\*\* | .14 |
| Procrastination Style *Non-procrastinators* *Academic productive*  *procrastinators* *Non-academic productive*  *procrastinators* *Non-academic procrastinators* *Classic procrastinators* | 0-.29.22.61.20 | ..16.15.16.18 | ..751.241.831.22 | .-1.811.473.81\*\*\*1.11 | ..11.09.23.07 |
|  |  |  |  |  |  |
|  | AUDIT scores |  |
| Gender | -.27 | .04 | 0.73 | -7.49\*\*\* | .46 |
| Procrastination Style *Non-procrastinators* *Academic productive*  *procrastinators* *Non-academic productive*  *procrastinators* *Non-academic procrastinators* *Classic procrastinators* | 0-.13.10.27.05 | ..09.08.09.11 | ..881.111.31.05 | .-1.441.253.00\*\*.45 | ..09.08.18.03 |
|  |  |  |  |  |  |
|  | Cravings |  |  |  |  |
| Gender | -1.06 | .51 | - | -2.89\* | .18 |
| Procrastination Style *Non-procrastinators* *Academic productive*  *procrastinators* *Non-academic productive*  *procrastinators* *Non-academic procrastinators* *Classic procrastinators* | 0.1611.283.581.61 | ..82.73.83.87 | ----- | ..201.764.30\*\*\*1.85 | ..01.11.26.11 |

Note: *N* = 1104. Procrastination (0=non-procrastinators, 1=academically productive procrastinators, 2=non-academic productive procrastinators, 3=non-academic procrastinators, 4=unproductive procrastinators) and gender were dummy-coded (0 = men, 1 = women). Cohen’s *d* = 2*t*/ √df. The regression models used generalized linear models with a negative binomial log link for all outcome variables other than cravings. The regression model for the cravings variable used ordinary least squares regression. \* = p < .05, \*\* = p < .01, \*\*\* = p < .001.

*Figure 1*. Five-cluster solution for procrastination styles with centered z-scores.



1. Percentages did not have to add up to 100% [↑](#footnote-ref-1)
2. ,3 Three items on the AUDIT and four items on the RAPI could be construed as possible instances of procrastination (e.g., “How often during the last year have you failed to do what was normally expected from you because of drinking?”). To rule out possible confounding effects, the AUDIT and RAPI were scored with and without these items for preliminary analysis. Results did not differ as a function of item inclusion, thus all AUDIT and RAPI items were retained in final analyses. [↑](#footnote-ref-2)
3. [↑](#footnote-ref-3)
4. Because hierarchical cluster analysis is sensitive to outliers, we first probed for significant univariate outliers using Grubb’s test. No outliers were detected. [↑](#footnote-ref-4)